

Video Game Play and Design: Procedural Directions



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Procedural Simulation: Time To Get Real

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SONY PICTURES
IMAGEWORKS



SIGGRAPH
2001

Procedural Simulation

- Realistic Behaviors - “A.I.”
- Any “On-The-Fly” Generated Action/Asset
 - NPC’s, Terrain, Textures, Weather, etc.
- Advantages:
 - Sophistication, Volume, Speed, Reusability
- Drawbacks:
 - Emerging Science, Complex, Expensive

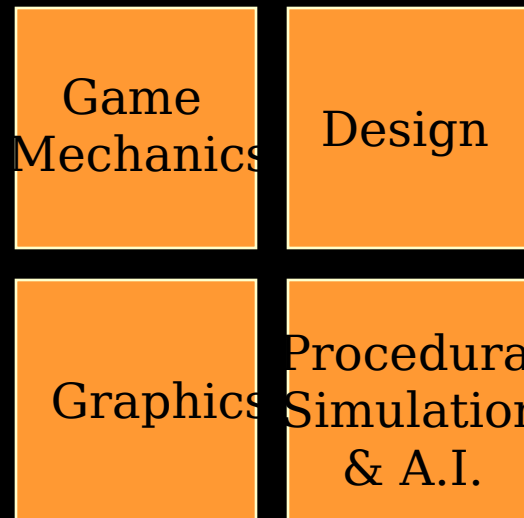
Overview

- Evolution of Game Consoles
 - More cycles, more storage, dynamic content
 - Procedural simulation as emerging R&D
- Impact on 3 Fronts:
 - Users
 - Developers
 - Unlikely Partners

The Old Days: Cram It In...

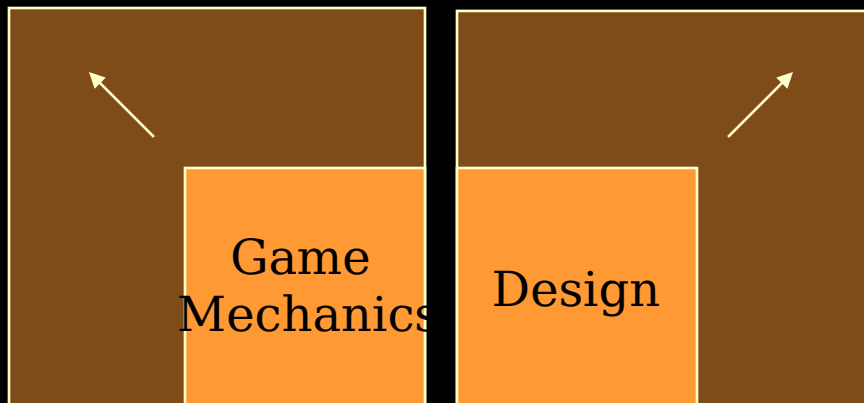
- Graphics, Mechanics, Design
 - Balancing cycles, storage
- Procedural Simulation
 - Pushes boundaries of game technology
 - Often forced to utilize “leftover” resources

Fitting It All In The Box



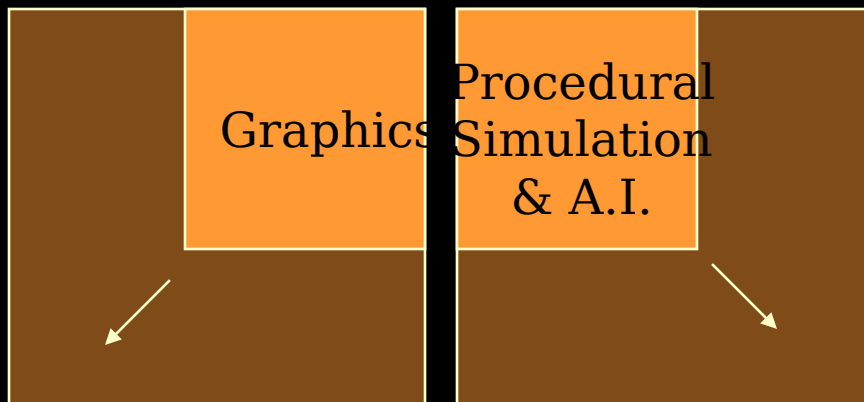
A Bigger Box To Fill...

- Advanced UI,
- Physics Engines,
- Smart Cameras, etc.



- Massive Worlds,
- Hybrid Genres,
- Sophisticated Sound, Stories, etc.

- Higher-Res Models,
- Natural Movement,
- Photorealism, etc.



- Smarter NPC's,
- Responsive Environments,
- ???

Today: Still Cramming, But...

- Faster Hardware
- High Capacity Delivery
 - CD v. DVD
- Local Storage
- Additional Content Via Internet

All Lines Point To Procedural Simulation

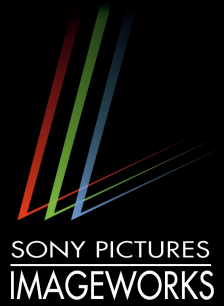
The X Axis: The User

- Deeper, Richer Content
 - Experience to showcase hardware capability
- Enhanced Gameplay
 - Smarter NPC's,
 - Wider variety of interactions
 - Variations from session to session
- Immersive Style Over Hyperrealism

The Y Axis: The Developer

- “That’s A Damned Big Box...”
 - Producing enough content
 - Internet connectivity = even more content
 - More money + more time = greater risk
 - Mechanics, Design, Graphics & A.I. all demand higher levels of expertise
 - How can I supplement my talent pool & spread my risk?

The Z Axis: Unlikely Partners



- The Motion Picture/TV Effects Industry
 - Historically overlapping talent pool
 - Gap in CG and Procedural Simulation narrowing
- Academia
- Console Manufacturers
- Other Centers of CG Research
 - Architecture, Medicine, Engineering, Military



Procedural Simulation

Satisfying:

- The User
 - Provides deep and challenging content
- The Developer
 - Provides economic way to produce larger volume of rich, innovative content
- The Now-More-Likely Partners
 - Additional revenue source
 - Real World application of their code

Making Procedural Simulation Work



- Development of Modular Code
 - Approach like a Graphics Engine
 - Amortize over multiple titles
- Enlist 3rd Party Resources - Joint Ventures
- Strive For Balanced Gameplay
- Establish Defining Style Instead of Realism

